

CLAIMS

What is claimed is:

- 5 1. A method for setting a remanent magnetization of a bias subassembly for biasing a free layer of a magnetic sensor, the method comprising:
 - providing within the bias subassembly a first bias layer of ferromagnetic material having a coercivity H_{c1} and
 - 10 providing a first bias to the free layer;
 - providing within the bias subassembly a second bias layer of ferromagnetic material having a coercivity H_{c2} greater than H_{c1} and providing a second bias to the free layer;
 - 15 providing within the bias subassembly a decoupling layer disposed between the first and second bias layers to substantially eliminate exchange coupling between the first and second bias layers; and
 - applying a first bias magnetic field having a magnetic
 - 20 field strength H_1 to the bias subassembly, wherein H_1 is greater than H_{c1} and H_1 is less than H_{c2} ;
 - whereby the first bias is altered, and the second bias is substantially unaltered.
- 25 2. The method of claim 1, further comprising applying a second bias magnetic field having a magnetic field strength H_2 to said bias subassembly, wherein H_2 is greater than H_{c2} .
- 30 3. The method of claim 1, further comprising:
 - applying a pass/fail test to said sensor after application of said first bias magnetic field;

selecting said sensor for further processing if said test is failed;

applying a second bias magnetic field having a magnetic field strength H_2 to said selected sensor, wherein
5 H_2 is greater than H_{c2} .

4. The method of claim 3, wherein said free layer has an electric current direction, and wherein said second bias magnetic field has a direction substantially the same as
10 said electric current direction.

5. The method of claim 3, wherein said free layer has an electric current direction, and wherein said second bias magnetic field has a direction other than said electric
15 current direction.

6. The method of claim 1, wherein said free layer has an electric current direction, and wherein said first bias magnetic field has a direction substantially the same as
20 said electric current direction.

7. The method of claim 1, wherein said free layer has an electric current direction, and wherein said first bias magnetic field has a direction other than said electric
25 current direction.